

<u>Set Name</u> side by side	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u> result set
<i>DB=USPT,PGPB,JPAB,EPAB,DWPI,TDBD; PLUR=YES; OP=ADJ</i>			
<u>L11</u>	l4 and extract\$6	8	<u>L11</u>
<u>L10</u>	us-6180359-\$.did.	2	<u>L10</u>
<u>L9</u>	electrodialy\$5 and hmtba	1	<u>L9</u>
<u>L8</u>	elecrodialy\$5	5	<u>L8</u>
<u>L7</u>	5814497.pn. and electrodialy\$5	0	<u>L7</u>
<u>L6</u>	5814497 and electrodialy\$5	2	<u>L6</u>
<u>L5</u>	electrodialy\$5 and l4	1	<u>L5</u>
<u>L4</u>	L3 and ammonia	11	<u>L4</u>
<u>L3</u>	3175000	17	<u>L3</u>
<u>L2</u>	L1	1	<u>L2</u>
<i>DB=USPT; PLUR=YES; OP=ADJ</i>			
<u>L1</u>	hydroxymethylthiobutyric acid	1	<u>L1</u>

END OF SEARCH HISTORY

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**Search Results - Record(s) 1 through 8 of 8 returned.**☐ 1. Document ID: US 6348328 B1

L11: Entry 1 of 8

File: USPT

Feb 19, 2002

US-PAT-NO: 6348328

DOCUMENT-IDENTIFIER: US 6348328 B1

TITLE: Compounds

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Image
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☐ 2. Document ID: US 6184414 B1

L11: Entry 2 of 8

File: USPT

Feb 6, 2001

US-PAT-NO: 6184414

DOCUMENT-IDENTIFIER: US 6184414 B1

TITLE: Process for producing ammonium-2-hydroxy-4-(methylthio)-butyrate, mixtures containing the same in liquid form and their use

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Image
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☐ 3. Document ID: US 6180359 B1

L11: Entry 3 of 8

File: USPT

Jan 30, 2001

US-PAT-NO: 6180359

DOCUMENT-IDENTIFIER: US 6180359 B1

TITLE: Industrial scale process for the preparation of 2-hydroxy-4-methylbutyric acid using a nitrilase

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Image
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☐ 4. Document ID: US 5976609 A

L11: Entry 4 of 8

File: USPT

Nov 2, 1999

US-PAT-NO: 5976609

DOCUMENT-IDENTIFIER: US 5976609 A

TITLE: Process for recovering 2-hydroxy-4-methylthiobutyric acid (MHA), MHA and its use

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Image
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☐ 5. Document ID: US 5670128 A

L11: Entry 5 of 8

File: USPT

Sep 23, 1997

US-PAT-NO: 5670128

DOCUMENT-IDENTIFIER: US 5670128 A

TITLE: Regeneration of sulfuric acid from sulfate by-products of  
2-hydroxy-4-(methylthio) butyric acid manufacture

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KMNC	Draw Desc	Image
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☐ 6. Document ID: US 5498790 A

L11: Entry 6 of 8

File: USPT

Mar 12, 1996

US-PAT-NO: 5498790

DOCUMENT-IDENTIFIER: US 5498790 A

TITLE: Regeneration of sulfuric acid from sulfate by-products of  
2-hydroxy-4-(methylthio)butyric acid manufacture

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KMNC	Draw Desc	Image
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☐ 7. Document ID: US 4912257 A

L11: Entry 7 of 8

File: USPT

Mar 27, 1990

US-PAT-NO: 4912257

DOCUMENT-IDENTIFIER: US 4912257 A

TITLE: Process for preparation of aqueous solutions of 2-hydroxy-4-methylthio butyric  
acid

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KMNC	Draw Desc	Image
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☐ 8. Document ID: US 4524077 A

L11: Entry 8 of 8

File: USPT

Jun 18, 1985

US-PAT-NO: 4524077

DOCUMENT-IDENTIFIER: US 4524077 A

TITLE: Liquid 2-hydroxy-4-methylthiobutyric acid and process for the preparation  
thereof

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KMNC	Draw Desc	Image
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**WEST**[Generate Collection](#)[Print](#)**Search Results - Record(s) 1 through 10 of 11 returned.**☐ 1. Document ID: US 6348328 B1

L4: Entry 1 of 11

File: USPT

Feb 19, 2002

US-PAT-NO: 6348328

DOCUMENT-IDENTIFIER: US 6348328 B1

TITLE: Compounds

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	RWMC	Draw Desc	Image
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☐ 2. Document ID: US 6224907 B1

L4: Entry 2 of 11

File: USPT

May 1, 2001

US-PAT-NO: 6224907

DOCUMENT-IDENTIFIER: US 6224907 B1

TITLE: Anti-asthma therapy

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	RWMC	Draw Desc	Image
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☐ 3. Document ID: US 6184414 B1

L4: Entry 3 of 11

File: USPT

Feb 6, 2001

US-PAT-NO: 6184414

DOCUMENT-IDENTIFIER: US 6184414 B1

TITLE: Process for producing ammonium-2-hydroxy-4-(methylthio)-butyrate, mixtures containing the same in liquid form and their use

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	RWMC	Draw Desc	Image
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☐ 4. Document ID: US 6180359 B1

L4: Entry 4 of 11

File: USPT

Jan 30, 2001

US-PAT-NO: 6180359

DOCUMENT-IDENTIFIER: US 6180359 B1

TITLE: Industrial scale process for the preparation of 2-hydroxy-4-methylbutyric acid using a nitrilase

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	RWMC	Draw Desc	Image
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☐ 5. Document ID: US 5976609 A

L4: Entry 5 of 11

File: USPT

Nov 2, 1999

US-PAT-NO: 5976609

DOCUMENT-IDENTIFIER: US 5976609 A

TITLE: Process for recovering 2-hydroxy-4-methylthiobutyric acid (MHA), MHA and its use

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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RMK	Draw Desc	Image
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☐ 6. Document ID: US 5670128 A

L4: Entry 6 of 11

File: USPT

Sep 23, 1997

US-PAT-NO: 5670128

DOCUMENT-IDENTIFIER: US 5670128 A

TITLE: Regeneration of sulfuric acid from sulfate by-products of 2-hydroxy-4-(methylthio) butyric acid manufacture

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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RMK	Draw Desc	Image
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☐ 7. Document ID: US 5498790 A

L4: Entry 7 of 11

File: USPT

Mar 12, 1996

US-PAT-NO: 5498790

DOCUMENT-IDENTIFIER: US 5498790 A

TITLE: Regeneration of sulfuric acid from sulfate by-products of 2-hydroxy-4-(methylthio)butyric acid manufacture

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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RMK	Draw Desc	Image
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☐ 8. Document ID: US 4912257 A

L4: Entry 8 of 11

File: USPT

Mar 27, 1990

US-PAT-NO: 4912257

DOCUMENT-IDENTIFIER: US 4912257 A

TITLE: Process for preparation of aqueous solutions of 2-hydroxy-4-methylthio butyric acid

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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RMK	Draw Desc	Image
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☐ 9. Document ID: US 4524077 A

L4: Entry 9 of 11

File: USPT

Jun 18, 1985

US-PAT-NO: 4524077

DOCUMENT-IDENTIFIER: US 4524077 A

TITLE: Liquid 2-hydroxy-4-methylthiobutyric acid and process for the preparation thereof

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 10. Document ID: US 4335257 A

L4: Entry 10 of 11

File: USPT

Jun 15, 1982

US-PAT-NO: 4335257

DOCUMENT-IDENTIFIER: US 4335257 A

TITLE: Preparation of the calcium salt of alpha-hydroxy-gamma-methylmercaptobutyric acid

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KNAC	Draw Desc	Image
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L4: Entry 11 of 11

File: DWPI

Aug 30, 1989

DERWENT-ACC-NO: 1989-250602

DERWENT-WEEK: 198935

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TITLE: 2-Hydroxy 4-methylthio butyric acid prepn. - by sulphuric acid hydrolysis of the butyronitrile, neutralisation and sepn.

< br>Basic Abstract Text:

Aq. solns. of 2-hydroxy-4-methylthio butyric acid  $\text{CH}_3\text{S}-\text{CH}_2-\text{CH}_2-\text{CHOH}-\text{COOH}$  (I) are pred. by the hydrolysis, using sulphuric acid, of 2-hydroxy-4-methylthio butyronitrile (II), in which a) the acidic hydrolysis mixt. and recycled material, is neutralised with  $\text{NH}_4\text{OH}$ , b) the two phases from the neutralisation are sepd., c) the aq. phase from b) is concn. to ppt ammonium sulphate, which is sepd. while the liq. contg. traces of (I) is recycled, d) the organic phase from b) is concn. to form a suspension, e) the suspension from d) is sepd. to eliminate residual ammonium sulphate, f) ammonium sulphate from e) is dissolved in water and recycled to a) to recover residual (I), and g) the liq. from e) is diluted with water and opt. stabilised with a small amt. of sulphuric acid.

Equivalent Abstract Text:

Aq. solns. of 2-hydroxy-4-methylthio butyric acid  $\text{CH}_3\text{S}-\text{CH}_2-\text{CH}_2-\text{CHOH}-\text{COOH}$  (I) are pred. by the hydrolysis, using sulphuric acid, of 2-hydroxy-4-methylthio butyronitrile (II), in which a) the acidic hydrolysis mixt. and recycled material, is neutralised with  $\text{NH}_4\text{OH}$ , b) the two phases from the neutralisation are sepd., c) the aq. phase from b) is concn. to ppt ammonium sulphate, which is sepd. while the liq. contg. traces of (I) is recycled, d) the organic phase from b) is concn. to form a suspension, e) the suspension from d) is sepd. to eliminate residual ammonium sulphate, f) ammonium sulphate from e) is dissolved in water and recycled to a) to recover residual (I), and g) the liq. from e) is diluted with water and opt. stabilised with a small amt. of sulphuric acid.

Equivalent Abstract Text:

Process for preparing aqueous solutions of 2-hydroxy-4-methylthiobutyric acid (hereinafter designated HMTBA) resulting from the hydrolysis reaction, in a single stage, of 2-hydroxy-4-methylthiobutyronitrile with sulphuric acid, characterised in that the following operations are carried out: a) neutralising the acidic mixture resulting from the hydrolysis reaction and the recyclings with ammonium hydroxide ( $\text{NH}_4\text{OH}$ ), so as to form two phases, an organic phase containing a predominant proportion of HMTBA and a secondary proportion of ammonium sulphate, and an aqueous phase containing a predominant proportion of ammonium sulphate and a secondary proportion of HMTBA; b) separating the two phases; c) precipitating the ammonium sulphate from the aqueous phase by evaporation of water, at atmospheric or reduced pressure, and then separating off the said ammonium sulphate by filtration and/or centrifuging, and recycling the resulting liquid, which contains unprecipitated ammonium sulphate and dissolved HMTBA, to the neutralisation reactor; d) concentrating the organic phase by evaporation of the water present in this phase in order to obtain an HMTBA suspension which contains a residual portion of ammonium sulphate; e) separating the suspension resulting from the previous operation, by centrifuging and/or settling, in order to obtain an HMTBA which is virtually free from ammonium sulphate and an impure ammonium sulphate cake containing HMTBA; f) dissolving in water the impure ammonium sulphate cake obtained in the previous operation and recycling the resulting solution to the neutralisation reactor; and g) diluting with water the HMTBA obtained in step e) and, if appropriate, stabilising it with a small quantity of



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☐ 11. Document ID: EP 330527 A, CA 1308419 C, DE 68902934 E, DK 8900788 A, EP 330527 B1, ES 2005784 A, ES 2045478 T3, IE 63393 B, PT 89776 A, US 4912257 A

L4: Entry 11 of 11

File: DWPI

Aug 30, 1989

DERWENT-ACC-NO: 1989-250602

DERWENT-WEEK: 198935

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TITLE: 2-Hydroxy 4-methylthio butyric acid prepn. - by sulphuric acid hydrolysis of the butyronitrile, neutralisation and sepn.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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L3 and ammonia

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